Lightweight, Compact Type LM Guide Model SRS

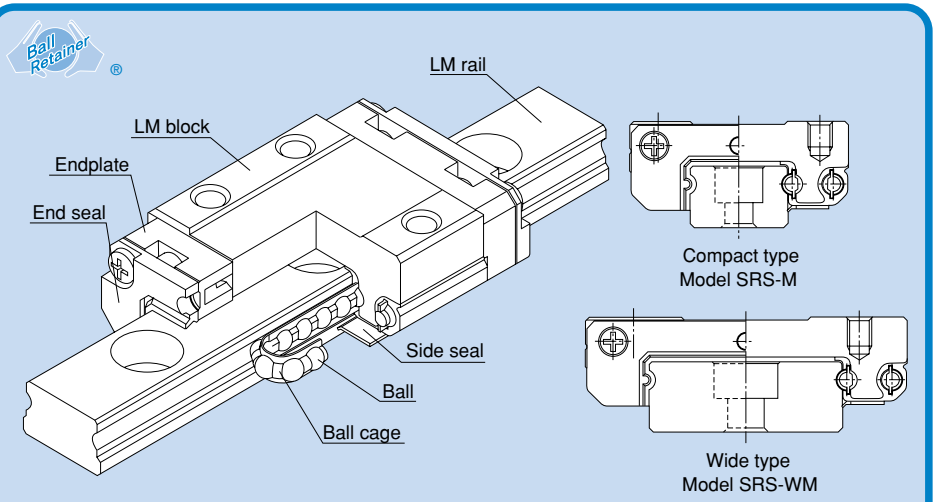


Fig. 1 Structure of Model SRS

Structure and Features

Caged Ball LM Guide model SRS has a structure where two raceways are incorporated into the compact body, enabling the model to receive loads in all directions, and to be used in locations where a moment is applied with a single rail. In addition, use of ball cages eliminates friction between balls, thus achieving high speed, low noise, acceptable running sound, long service life, and long-term maintenance-free operation.

●Low dust generation

Use of ball cages eliminates friction between balls and retains lubricant, thus achieving low dust generation. In addition, the LM block and LM rail use stainless steel, which is highly resistant to corrosion.

●4-way equal load type

Since the right and left rows of balls under a load contact the raceway at 45°, this LM Guide is capable of receiving loads in the radial, reverse-radial and lateral directions at equal values and being used in any orientations. With this well-balanced structure, this model can be used in extensive applications.

●Compact

Since SRS has a compact structure where the rail cross section is designed to be low and that contains only two rows of balls, it can be installed in space-saving locations.

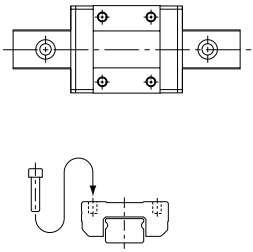
●Lightweight

Since part of the LM block (e.g., around the ball relief hole) is made of resin and formed through insert molding, SRS is a lightweight, low inertia type of LM Guide.

Types and Features

Model SRS-M

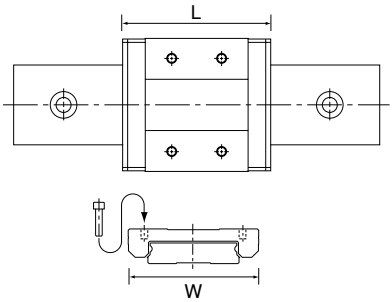
A standard type of SRS.



Note: In addition to model SRS-M, a full-ball type without ball cage is also available. If desiring this type, indicate type "SRS-G" when placing an order. However, since SRS-G does not have a ball cage, its dynamic load rating is smaller than SRS-M. See the table of basic load ratings for SRS-G on page a-179 for details.

Model SRS-WM

Has a longer overall LM block length (L), a greater width and a larger rated load and permissible moment than SRS-M.



Note: In addition to model SRS-MW, a full-ball type without ball cage is also available. If desiring this type, indicate type "SRS-G" when placing an order. However, since SRS-G does not have a ball cage, its dynamic load rating is smaller than SRS-MW. See the table of basic load ratings for SRS-G on page a-181 for details.

Rated Loads in All Directions

Model SRS is capable of receiving loads in all four directions: radial, reverse-radial and lateral directions.
Their basic dynamic load ratings are represented by the symbols in the radial direction indicated in Fig. 2, and the actual values are provided in the dimensional table for SRS. The values in the reverse-radial and lateral directions are obtained from table 1.

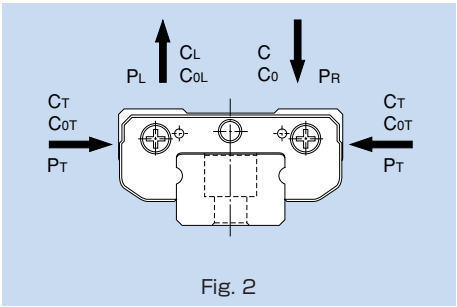


Fig. 2

Table 1 Rated Loads of Model SRS in All Directions

Direction	Basic dynamic load rating	Basic static load rating
Radial direction	C	C_0
Reverse-radial direction	C_L=C	C_{0L}=C_0
Lateral direction (9M/9WM/20M)	C_T=1.19C	C_{0T}=1.19C_0
Lateral direction (12M/12WM/ 15M/15WM/25M)	C_T=C	C_{0T}=C_0

Equivalent Load

When the LM block of model SRS receives a reverse-radial load and a lateral load simultaneously, the equivalent load is obtained from the equation below.

$$P_E = X \cdot P_R\ (P_L) + Y \cdot P_T$$

where
P_E : Equivalent load (N)
・Radial direction
・Reverse-radial direction
・Lateral direction
P_R : Radial load (N)
P_L : Reverse-radial load (N)
P_T : Lateral load (N)
X, Y : Equivalent factor (see table 2)

Table 2 Equivalent Factor of Model SRS

Equivalent load P_E	Model No.	X	Y
Radial and reverse-radial directions	9M/9WM/ 20M	1	0.839
	12M/12WM/ 15M/ 15WM/25M	1	1
Lateral direction	9M/ 9WM/20M	1.192	1
	12M/12WM/15M/ 15WM/25M	1	1

Options

Dust Prevention Accessories

THK offers various dust prevention accessories for models SRS.
When a dust prevention accessory is required, specify the desired item with the corresponding symbol provided in table 3 (for details of dust prevention accessories, see pages a-24 and a-25).
For supported model numbers for dust prevention accessories and overall LM block length with dust prevention accessories attached (dimension L), see page a-182.

Table 3 Symbols of Dust Prevention Accessories for Models SRS

Symbol	Dust prevention accessory
UU	With end seal
SS	With end seal + side seal
SSHH	With end seal + side seal + LaCS

Seal resistance value

For the maximum seal resistance value per LM block when a lubricant is applied on seal SRS ··· SS, refer to the corresponding value provided in table 4.

Table 4 Maximum Seal Resistance Value of Seal SRS ··· SS

Unit: N

Model No.	Seal resistance value
SRS 9M	0.2
SRS 9WM	1.0
SRS 12M	0.6
SRS 12WM	1.3
SRS 15M	1.0
SRS 15WM	1.6
SRS 20M	1.3
SRS 25M	1.6

●Dedicated Cap C for LM Rail Mounting Holes

If any of the LM rail mounting holes of an LM Guide is filled with cutting chips or foreign matter, they may enter the LM block structure. Entrance of such foreign matter can be prevented by covering each LM rail mounting hole with the dedicated cap so that the top of the mounting holes are on the same level as the LM rail top face.

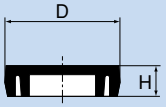
Since the dedicated cap C for LM rail mounting holes uses a special synthetic resin with high oil resistance and high wear resistance, it is highly durable.

When placing an order, specify the desired cap type with the corresponding cap number indicated in table 5.

For the procedure for mounting the cap, see page a-22.

Table 5 Major Dimensions of Dedicated Cap C

Model No.	Cap C model No.	Bolt used	Major dimensions mm	
			D	H
SRS 9WM	C3	M3	6.3	1.2
SRS 12M	C3	M3	6.3	1.2
SRS 15M	C3	M3	6.3	1.2
SRS 20M	C5	M5	9.8	2.4
SRS 25M	C6	M6	11.4	2.7



Dedicated Cap C

QZ™ Lubricator

When QZ Lubricator is required, specify the desired type with the corresponding symbol indicated in table 6 (for details of QZ Lubricator, see pages a-19 and a-20).

For supported LM Guide model numbers for QZ Lubricator and overall LM block length with QZ Lubricator attached (dimension L), see page a-182.

Table 6 Parts Symbols for Model SRS with QZ Lubricator Attached

Symbol	Dust prevention accessories for LM Guide with QZ Lubricator attached
QZUU	With end seal + QZ Lubricator
QZSS	With end seal + side seal + QZ Lubricator
QZSSHH	With end seal + side seal + LaCS + QZ Lubricator

Grease Nipple and Greasing Hole

Model SRS does not have a grease nipple as standard. Installation of a grease nipple and the drilling of a greasing hole is performed at THK. When ordering SRS, indicate that the desired model requires a grease nipple or greasing hole (for greasing hole dimensions and supported grease nipple types and dimensions, see table 7).
When using SRS under harsh conditions, use QZ Lubricator* (optional) or Laminated Contact Scraper LaCS* (optional).

Note 1: Grease nipple is not available for models SRS9M, SRS9WM, SRS12M and SRS12WM. They can have a greasing hole.
Note 2: Using a greasing hole other than for greasing may cause damage.
Note 3: For QZ Lubricator* and Laminated Contact Scraper LaCS*, see pages a-19 and a-20, and pages a-29 and a-30, respectively.
Note 4: When desiring a grease nipple for a model attached with QZ Lubricator, contact THK.

Table 7 Table of Grease Nipple and Greasing Hole Dimensions

Unit: mm

Model No.	E	Grease nipple or greasing hole
SRS 9M	—	ϕ1.5 drilled hole
SRS 9WM	—	ϕ1.6 drilled hole
SRS 12M	—	ϕ2.0 drilled hole
SRS 12WM	—	ϕ2.0 drilled hole
SRS 15M	4.0(5.0)	PB107
SRS 15WM	4.0(5.0)	PB107
SRS 20M	3.5(5.0)	PB107
SRS 25M	4.0(5.5)	PB1021B

Note: Figures in the parentheses indicate dimensions without a seal.

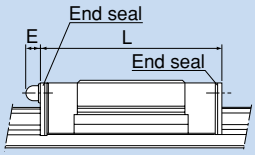


Fig. 3

Note: For the L dimension, see the corresponding dimension table.

Flatness of the LM Rail and the LM Block Mounting Surface

The values in table 8 apply when the clearance is a normal clearance. If the clearance is C1 clearance and two rails are used in combination, we recommend using 50% or less of the value in the table.

Note: Since SRS has Gothic-arch grooves, any accuracy error in the mounting surface may negatively affect the operation. Therefore, we recommend using SRS on a highly accurate mounting surface.

Table 8 Flatness of the LM Rail and the LM Block Mounting Surface

Unit: mm

Model No.	Flatness
SRS 9M	0.035/200
SRS 9WM	0.035/200
SRS 12M	0.050/200
SRS 12WM	0.050/200
SRS 15M	0.060/200
SRS 15WM	0.060/200
SRS 20M	0.070/200
SRS 25M	0.070/200

Standard Length and Maximum Length of the LM Rail

Table 9 shows the standard lengths and the maximum lengths of model SRS variations. If the maximum length of the desired LM rail exceeds them, connected rails will be used. Contact THK for details.

For the G dimension when a special length is required, we recommend selecting the corresponding G value from the table. The longer the G dimension is, the less stable the G area may become after installation, thus causing an adverse impact to accuracy.

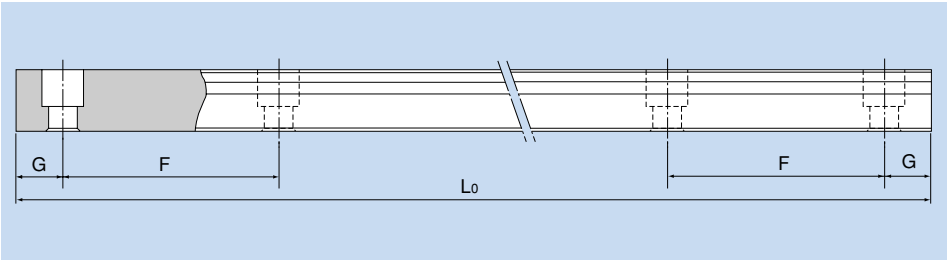


Table 9 Standard Length and Maximum Length of the LM Rail for Model SRS

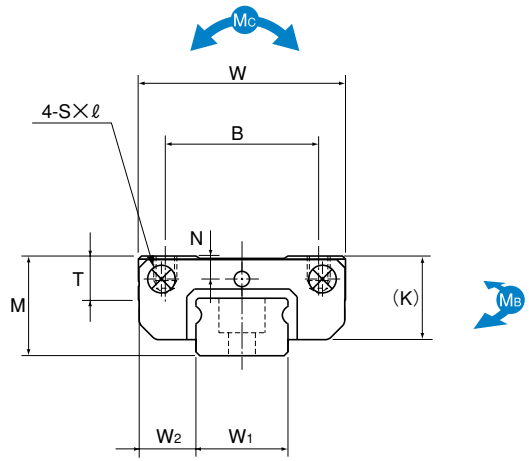
Unit: mm

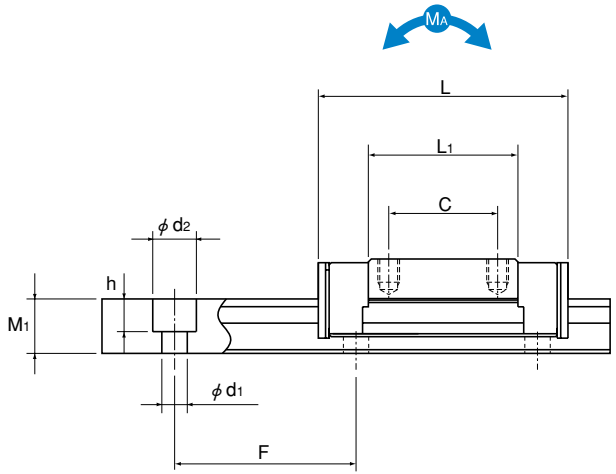
Model No.	SRS 9M	SRS 9WM	SRS 12M	SRS 12WM	SRS 15M	SRS 15WM	SRS 20M	SRS 25M
Standard LM rail length (L_0)	55 75 95 115 135 155 175 195 275 375	50 80 110 140 170 200 260 290 320	70 95 120 145 170 195 220 245 270 320 370 470 570	70 110 150 190 230 270 310 390 470 550	70 110 150 190 230 270 310 350 390 430 470 550 670 870	110 150 190 230 270 310 430 550 670 790	220 280 340 460 640 880 1000	220 280 340 460 640 880 1000
Standard pitch F	20	30	25	40	40	40	60	60
G	7.5	10	10	15	15	15	20	20
Max length	1000	1000	1340	1430	1430	1800	1800	1800

Note 1: The maximum length varies with accuracy grades. Contact THK for details.

Note 2: If connected rails are not allowed and a greater length than the maximum values above is required, contact THK.

Model SRS-M





Unit: mm

Model No.	External dimensions			LM block dimensions							LM rail dimensions					Basic load rating		Static permissible moment N-m*					Mass	
	Height	Width	Length								Width		Height	Pitch		C	Co	MA		MB		MC	LM block	LM rail
	M	W	L	B	C	S× ℓ	L1	T	K	N	W1	W2	M1	F	d1×d2×h	kN	kN	1 block	2 blocks in close contact	1 block	2 blocks in close contact	1 block	kg	kg/m
SRS 9M	10	20	30.8	15	10	M3×2.8	19.8	4.9	9.1	2.4	9 $^{0}_{-0.02}$	5.5	5.5	20	3.5×6×3.3	2.69	2.31	7.82	43.9	9.03	50.8	10.6	0.016	0.32
SRS 12M	13	27	34.4	20	15	M3×3.2	20.6	5.7	11	3	12 $^{0}_{-0.02}$	7.5	7.5	25	3.5×6×4.5	4	3.53	12	78.5	12	78.5	23.1	0.027	0.65
SRS 15M	16	32	43	25	20	M3×3.5	25.7	6.5	13.3	3	15 $^{0}_{-0.02}$	8.5	9.5	40	3.5×6×4.5	6.66	5.7	26.2	154	26.2	154	40.4	0.047	0.96
SRS 20M	20	40	50	30	25	M4×6	34	9	16.6	4	20 $^{0}_{-0.03}$	10	11	60	6×9.5×8	7.75	9.77	54.3	296	62.4	341	104	0.11	1.68
SRS 25M	25	48	77	35	35	M6×7	56	11	20	5	23 $^{0}_{-0.03}$	12.5	15	60	7×11×9	16.5	20.2	177	932	177	932	248	0.24	2.6

Note Since it uses stainless steel in the LM block, LM rail and balls, this model is highly resistant to corrosion and environment.

Note If a grease nipple is required, indicate "with grease nipple" (available for models SRS 15M/15WM/20M/25M).
If a greasing hole is required, indicate "with greasing hole" (available for models SRS 9M/9WM/12M/12WM).

Static permissible moment*:
1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

SRS-G Basic Load Ratings

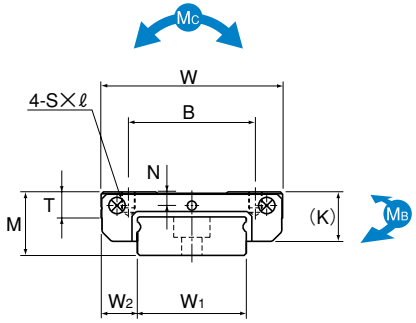
Model No.	Basic load rating C kN	Basic load rating Co kN
SRS 9MG	2.07	2.32
SRS 12MG	3.36	3.55
SRS 15MG	5.59	5.72
SRS 20MG	5.95	9.40
SRS 25MG	13.3	22.3

Model number coding

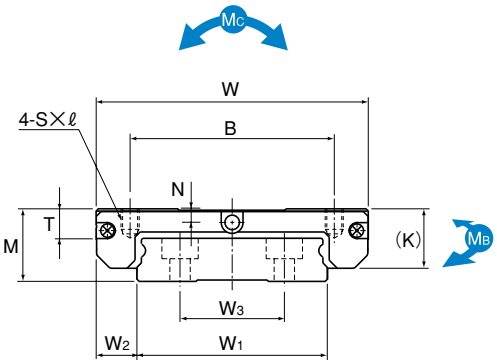
2 SRS20M QZ UU C1 +220L P M-II
1 2 3 4 5 6 7 8 9

1 No. of LM blocks used on the same rail 2 Model number 3 With QZ Lubricator
4 Dust prevention accessory symbol (see page a-173) 5 Radial clearance symbol (see page a-35)
6 LM rail length (in mm) 7 Accuracy symbol (see page a-45) 8 LM rail is made of stainless steel
9 No. of rails used on the same plane

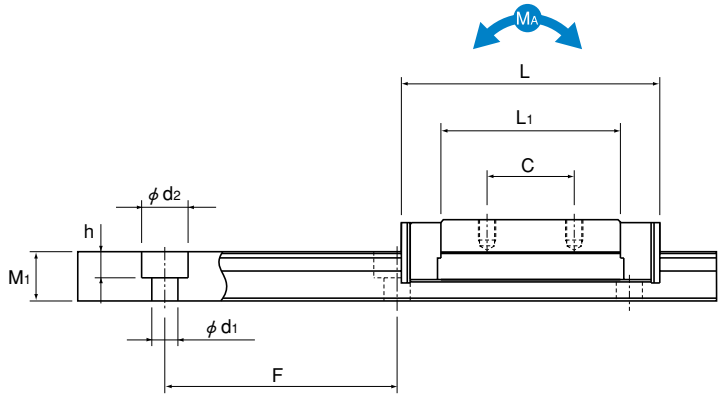
Note This model number indicates that a single-rail unit constitutes one set (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum).
Those models equipped with QZ Lubricator cannot have a grease nipple.



Models SRS9WM and 12WM



Model SRS15WM



Unit: mm

Model No.	External dimensions			LM block dimensions							LM rail dimensions						Basic load rating		Static permissible moment N-m*						Mass	
	Height	Width	Length								Width			Height	Pitch		C	Co	MA		MB		MC		LM block	LM rail
	M	W	L	B	C	S× ℓ	L1	T	K	N	W1	W2	W3	M1	F	d1×d2×h	kN	kN	1 block	2 blocks in close contact	1 block	2 blocks in close contact	1 block		kg	kg/m
SRS 9WM	12	30	39	21	12	M3×2.8	27	4.9	9.1	2.3	18 $^{0}_{-0.02}$	6	—	7.5	30	3.5×6×4.5	3.29	3.34	14	78.6	16.2	91	31.5		0.031	1.01
SRS 12WM	14	40	44.5	28	15	M3×3.5	30.9	5.7	11	3	24 $^{0}_{-0.02}$	8	—	8.5	40	4.5×8×4.5	5.48	5.3	26.4	143	26.4	143	66.5		0.055	1.52
SRS 15WM	16	60	55.5	45	20	M4×4.5	38.9	6.5	13.3	3	42 $^{0}_{-0.02}$	9	23	9.5	40	4.5×8×4.5	9.12	8.55	51.2	290	51.2	290	176		0.13	2.87

Note Since it uses stainless steel in the LM block, LM rail and balls, this model is highly resistant to corrosion and environment.

Note If a grease nipple is required, indicate "with grease nipple" (available for models SRS 15M/15WM/20M/25M).
If a greasing hole is required, indicate "with greasing hole" (available for models SRS 9M/9WM/12M/12WM).

Static permissible moment*:
1 block: static permissible moment value with 1 LM block
2 blocks: static permissible moment value with 2 blocks closely contacting with each other

SRS-G Basic Load Ratings

Model No.	Basic load rating C kN	Basic load rating Co kN
SRS 9WM	2.67	3.35
SRS 12WM	4.46	5.32
SRS 15WM	7.43	8.59

Model number coding 2 SRS15WM QZ UU C1 +550L P M- II

1 2 3 4 5 6 7 8 9

1 No. of LM blocks used on the same rail 2 Model number 3 With QZ Lubricator
4 Dust prevention accessory symbol (see page a-173) 5 Radial clearance symbol (see page a-35)
6 LM rail length (in mm) 7 Accuracy symbol (see page a-45) 8 LM rail is made of stainless steel
9 No. of rails used on the same plane

Note This model number indicates that a single-rail unit constitutes one set (i.e., required number of sets when 2 rails are used in parallel is 2 at a minimum).
Those models equipped with QZ Lubricator cannot have a grease nipple.

Overall LM Block Length with Options

Overall LM Block Length (Dimension L) of Model SRS with a Dust Prevention Accessory Attached

Unit: mm

Model No.	UU	SS	SSHH
SRS 9	30.8	30.8	—
SRS 9W	39	39	—
SRS 12	34.4	34.4	—
SRS 12W	44.5	44.5	—
SRS 15	43	43	—
SRS 15W	55.5	55.5	—
SRS 20	50	50	67.2
SRS 25	77	77	95.2

Note: "—" indicates not available.

Overall LM Block Length (Dimension L) of Model SRS with QZ Lubricator Attached

Unit: mm

Model No.	QZUU	QZSS	QZSSHH
SRS 9	40.8	40.8	—
SRS 9W	49	49	—
SRS 12	44.4	44.4	—
SRS 12W	54.5	54.5	—
SRS 15	55	55	—
SRS 15W	67.5	67.5	—
SRS 20	66	66	83.2
SRS 25	97	97	115.2

Note: "—" indicates not available.

Overall LM Block Length without Seal

Unit: mm

Model No.	Without seal
SRS 9	27.8
SRS 9W	36
SRS 12	31.4
SRS 12W	41.5

Model No.	Without seal
SRS 15	40
SRS 15W	52.5
SRS 20	47
SRS 25	73

Basic Specifications of LaCS®

① Service temperature range of LaCS: -20℃ to +80℃
② Resistance of LaCS: indicated in table 10

Table 10 Resistance of LaCS

Unit: N

Model No.	Resistance of LaCS
SRS 20	5.2
SRS 25	7.8

Note 1: Each resistance value in the table only consists of that of LaCS, and does not include sliding resistances of seals and other accessories.
Note 2: For the maximum service speed of LaCS, contact THK.

Grease Nipple

Those LM Guide models without QZ Lubricator are equipped with a grease nipple. Fig. 4 shows the mounting location for the grease nipple. Please note that attaching the grease nipple increases the LM block width.

■For LM Guide Models with Dust Prevention Accessories SSHH

LM Guide models with dust prevention accessories SSHH have the grease nipple in the location indicated in Fig. 4. Table 11 shows incremental dimensions with the grease nipple.

Grease nipple mounting location for model SRS

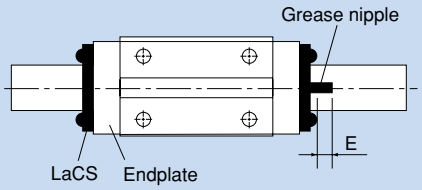


Fig. 4

Table 11

Unit: mm

Model No.	Incremental dimension with grease nipple E	Nipple type
SRS 25	4	PB1021B

Note: When desiring the mounting location for the grease nipple other than the one indicated in Fig. 4, contact THK.

■For LM Guide Models with Dust Prevention Accessories UU or SS

For the incremental dimension of the grease nipple when dust prevention accessories UU or SS are attached, see table 7 on page a-175.

Model number coding 2SRS25M QZ SSHH +1000L P M-Ⅱ
1 2 3

1 LM Guide model number
2 QZ: with QZ Lubricator, without grease nipple No symbol: without QZ Lubricator
3 Dust prevention accessory symbol (see page a-173)

Note 1: QZ Lubricator and LaCS are not sold alone.
Note 2: Those models equipped with QZ Lubricator cannot have a grease nipple. When desiring both QZ Lubricator and LaCS to be attached, contact THK.
Note 3: When desiring a model without QZ Lubricator and with a grease nipple, indicate "with grease nipple" (otherwise, the grease nipple will not be provided).

Precautions on Use

■Laminated Contact Scraper LaCS for THK LM Guides

Service environment

●Be sure the service temperature range of Laminated Contact Scraper LaCS is between -20℃ and +80℃, and do not clean LaCS in an organic solvent or white kerosene, or leave it unpacked.

Impregnating oil

●The lubricant impregnated into Laminated Contact Scraper LaCS is used to increase the sliding capability of LaCS itself. For lubrication of the LM Guide, attach QZ Lubricator or the grease nipple.

Function

●The intended role of Laminated Contact Scraper LaCS is to remove foreign matter or liquids. To seal oils, end seals are needed.

Design

●When using Laminated Contact Scraper LaCS, be sure to use the dedicated cap C for LM rail mounting holes or an appropriate form of cover.

■QZ Lubricator for THK LM Guides

Handling

●Dropping or hitting this product may damage it. Take much care when handling it.
●Do not clean it with an organic solvent or white kerosene.
●Do not leave it unpacked for a long period of time.
●Do not block the air vent with grease or the like.

Service temperature range

●Be sure the service temperature of this product is between -10℃ and +50℃.

Use in a special environment

●When using it in a special environment, contact THK.

Precaution on selection

●Be sure the stroke is longer than the overall length of the LM block length attached with QZ Lubricator.

Corrosion prevention of LM Guides

●QZ Lubricator is a lubricating device designed to feed a minimum amount of oil to the ball raceway of LM rails, and does not provide corrosion prevention to the whole LM Guide. When using it in an environment subject to a coolant or the like, we strongly recommend taking an anti-corrosion measure.